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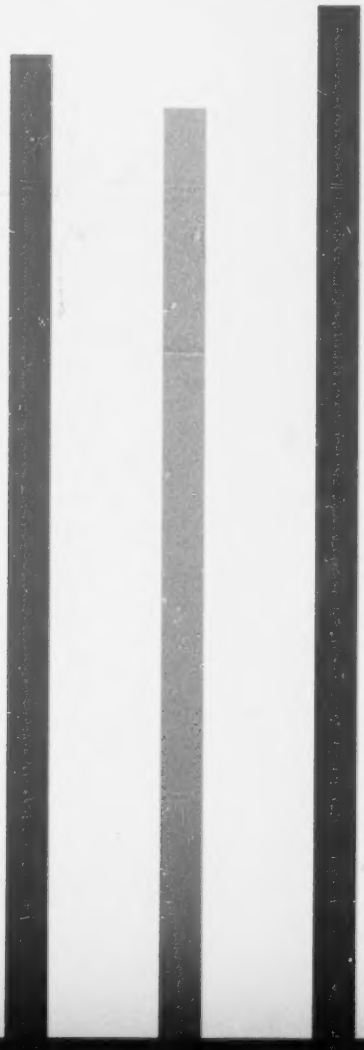
COUNCIL
ON
COMPETITIVENESS

COMPETITIVENESS INDEX



INTRODUCTION

The Council on Competitiveness is pleased to publish its first Competitiveness Index. The Index has one fundamental purpose: to translate "competitiveness" into terms that the American public can readily understand. The Council defines "competitiveness" as "the degree to which a nation can, under free and fair market conditions, produce goods and services that meet the test of international markets while simultaneously maintaining or expanding the real incomes of its citizens." The Council believes that sustained and effective steps to help U.S. businesses and workers compete will not occur until the American people know where they stand in the world economy — and, more important, until they recognize how America's standing affects their daily lives.

The Index translates into concrete terms the vague public anxiety that the United States is losing its competitive edge. Although economic indicators such as GNP growth, inflation and unemployment are reported regularly, there is no set of economic indicators that systematically measures America's ability to compete in world markets. The Competitiveness Index was created to show how U.S. economic performance compares to that of other nations and how current U.S. performance compares to its past record. The Index is a guide for the American people, not a sophisticated tool for policymakers or a definitive economic analysis. It is a snapshot of what the Council believes are the key indicators of U.S. competitiveness.

The Pyramid of Competitiveness

No single measure adequately reflects the complexity of a nation's competitive performance. Consequently, the Council has compiled a box score — comprising four indicators that we believe combine to form the critical and interrelated building blocks of competitiveness.

Picture a pyramid. At the pyramid's pinnacle is the **standard of living**, the ultimate aim of a productive nation. Standard of living is measured here as Gross Domestic Product plus the current account balance divided by the number of employed persons. As such, it shows on a per worker basis how much income is generated, plus or minus any change in what is owed to foreigners.

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How well we live is increasingly determined by how well we compete with foreign products. Therefore, just below standard of living is **trade** — what we sell overseas compared to what we buy. The Index reports the U.S. share of world exports as the measure of the U.S. ability to compete in international markets.

Our ability to compete in international markets, in turn, is influenced by our **productivity**, or output per employee. U.S. productivity fundamentally affects the cost of American products relative to those of other nations. Because the bulk of U.S. trade is in manufactured goods, the Index focuses on manufacturing productivity.

Finally, at the base of the pyramid are the building blocks of productivity — the combined **investment in education, R&D, and plant and equipment**. These investments build the skills, knowledge and assets that underpin long-term international economic success. They are calculated here as a weighted average of the percent of GNP spent annually in these three areas. While the first three indicators provide a snapshot of current U.S. performance, the Investment Index shows whether the United States is positioning itself for long-term success.

Without overstating the direct cause-and-effect relationships or underestimating the time lags, it is important to see the links among these four categories — how our standard of living is related to how much we sell abroad, how our exports depend in part on how productively we work, and how our productivity depends significantly on how wisely we invest. Although a nation may be able to maintain a high standard of living in the short-term, it cannot do so in the long-run without sustained attention to trade, productivity and investment. (A more detailed description of these four components is found in the appendices.)

No single number can capture a phenomenon as complex as competitiveness. Nevertheless, based on extensive research and discussions with leading business, academic and labor executives and economists, the Council believes that these four indicators together comprise the best possible summary of U.S. competitiveness.

Relative Performance

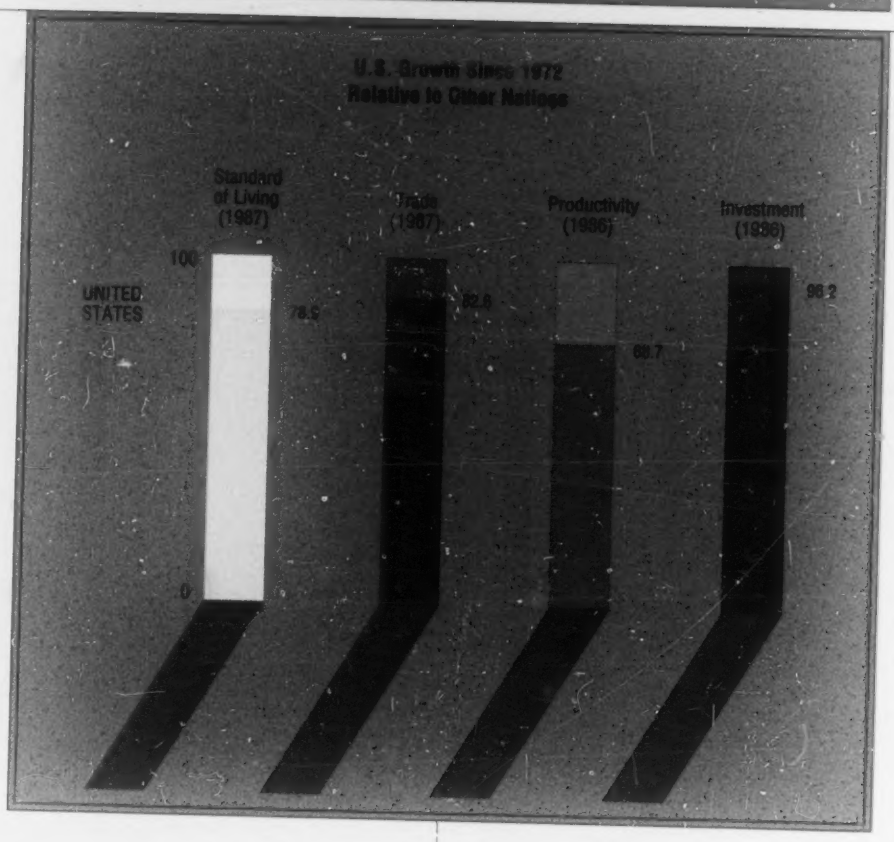
The Index is unique in that it compares current U.S. performance to past performance and to the performance of other nations. This relative comparison is critical. The U.S. economy cannot be judged in isolation from the rest of the world; it must be viewed relative to that of our major competitors. Just as there is no single indicator of competitiveness, there is no single nation against which to measure America's performance. In three of the four categories — standard of living, productivity and investment — the Council's Index focuses on how the United States compares to the average of the **Other Summit 7** industrialized countries: Canada, France, Italy, Japan, United Kingdom and West Germany. In the remaining category — trade — the U.S. performance is reported as a share of the world total in order to take into account the rapid export growth of Asia and Latin America.

Information is also provided on how the U.S. compares with two specific nations within the Other Summit 7 category: **Japan and West Germany**. Although these two countries are included in the average of the Other Summit 7, they are also listed separately because they are our two biggest industrial competitors. The

Council would also have liked to include the performance of the Newly Industrialized Countries (such as Hong Kong, South Korea, Taiwan, Mexico and Brazil), but the lack of timely, accurate data made that impossible.

The Council chose 1972 as its base year in order to show how the United States has performed over the long-term. The Council set the Index equal to 100 for that year. **A rise in the Index to more than 100 shows that the United States has outperformed other nations since then; a drop in the Index to below 100 shows that other countries are outperforming the United States.** In each of the four categories — standard of living, trade, productivity and investment — the Index has dropped below 100, in some cases significantly, showing that the United States has been outperformed by other countries.

The Council, with the help of The WEFA Group (Wharton Econometric Forecasting Associates), intends to update its Index on a semi-annual basis. The next Index will be released in January 1989. By publishing the Index twice a year, the Council hopes to develop ongoing public awareness and understanding of the competitiveness crisis and, more important, to help build public support for the steps required to improve America's ability to compete in world markets.



Standard of Living, Productivity and Investment measure U.S. growth compared to the average growth of the Other Summit 7 industrial nations: Canada, France, Japan, Italy, United Kingdom and West Germany. Trade measures U.S. export growth as a share of world export growth. The base year, 1972, equals 100; measured in constant 1980 dollars.

The Bottom Line

- In all four categories, U.S. performance is below 100, showing that since 1972 increases in America's standard of living, trade, productivity and investment have not kept pace with the performance of our major foreign competitors.
- The last year saw continued declines in the Standard of Living Index and Productivity Index, but improvements in the Trade Index and no change in the Investment Index.

Standard of Living

- Since 1972, the U.S. standard of living has grown only *one-fourth* as fast as the average standard of living of the Other Summit 7 industrial nations. As a result, the Standard of Living Index has dropped 21.1 points, from 100 to 78.9.
- In 1987, America's standard of living continued to grow more slowly than that of Other Summit 7 countries; as a result, the Standard of Living Index fell by 0.9 points last year alone.

Trade

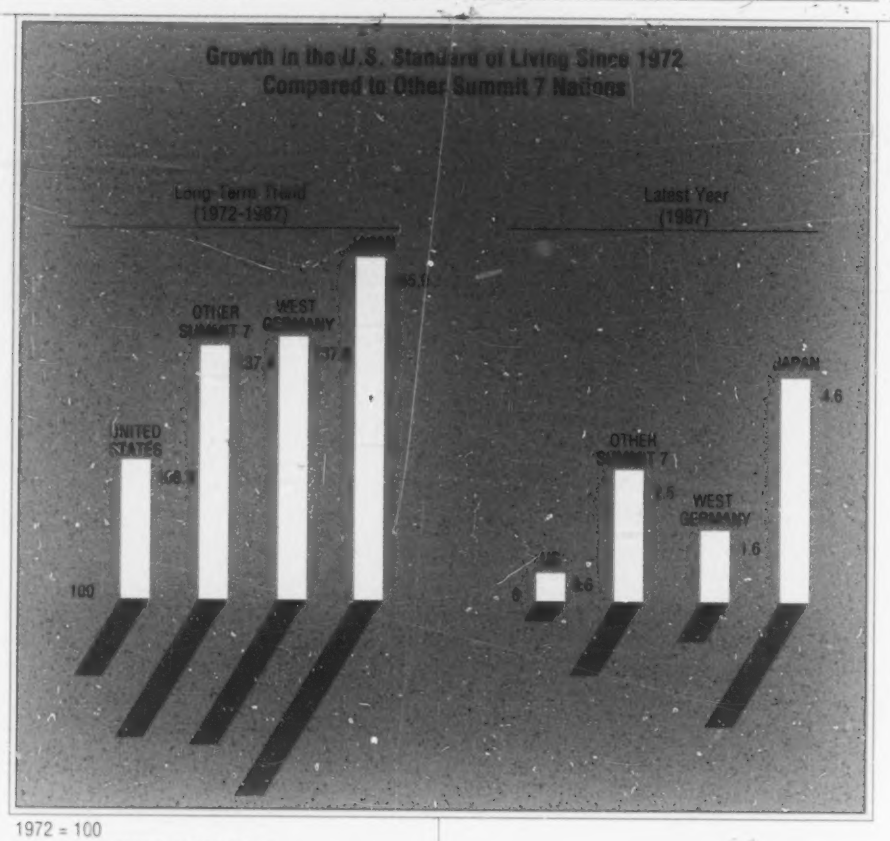
- Since 1972, as the U.S. share of world exports has declined, the Trade Index has fallen from 100 to 82.6. This decline reflects the rapid export growth of Japan and other newly developing countries in Asia and Latin America.
- In 1987, aided by a lower dollar, America's exports increased much faster than the rest of the world's and three times faster than Japan's. As a result, the Trade Index rebounded from 74.5 to 82.6.
- Because U.S. imports also rose sharply in 1987, however, the U.S. trade deficit did not decline.

Productivity

- Sluggish U.S. manufacturing productivity growth relative to Japan, West Germany and the other industrial nations since 1972 has driven down the Productivity Index from 100 to 68.7.
- In the latest year (1986), the Productivity Index declined slightly, showing that U.S. manufacturing productivity continues to grow at a slower rate than the average of the Other Summit 7 industrial nations.

Investment

- Since 1972, U.S. investment in future competitiveness has not kept pace with the investment of the Other Summit 7 nations as a percent of GNP. As a result, the Investment Index has dropped from 100 to 96.2.
- In the latest year for which data are available (1986), the United States increased its investment in R&D, capital equipment and education at about the same rate as the Other Summit 7 nations; as a result, the Investment Index remained steady at 96.2.



1972 = 100
Measured in constant 1980 dollars.

■ Since 1972, the U.S. standard of living measure increased from 100 to 108.3 points, only about one-fourth as fast as the average of the Other Summit 7 and West Germany, and only about one-seventh as fast as Japan (See chart, above left).

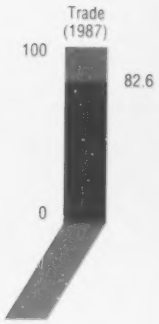
■ Because U.S. growth has been slower than the average of the Other Summit 7 nations since 1972, the Standard of Living Index has declined 21.1 points over the past 15 years from 100 to 78.9 (See Index, upper left).

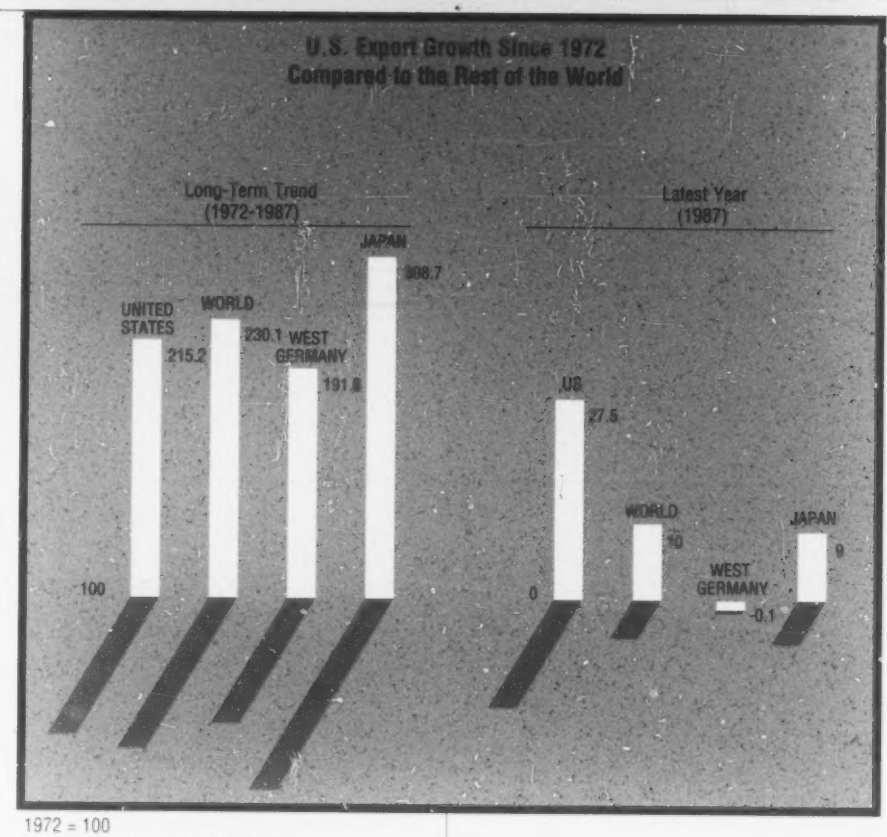
■ The latest standard of living figures continue the long-term trend. The American standard of living increased by only 0.6 points in 1987, less than the average of the Other Summit 7, West Germany and Japan (See chart, upper right). Since the U.S. standard of living grew more slowly than the Other Summit 7 last year, the Standard of Living Index slipped from 79.8 to 78.9.

■ In absolute terms, the average American's standard of living is still higher than the average of the Other Summit 7, but because of slower U.S. growth, those nations are rapidly catching up. (Detailed information is provided in Appendix I: Trends in Absolute Growth.)

■ Similar trends are evident in wages for American manufacturing workers. Since 1972, U.S. manufacturing wages have increased much more slowly than West Germany's or Japan's. As a result, West German manufacturing workers now earn substantially more than Americans, and the Japanese are rapidly gaining. (Detailed information is provided in Appendix II: Background Data.)

Standard of Living is defined as Gross Domestic Product plus the balance on the current account divided by the number of employed persons. A rising standard of living is the ultimate aim of a productive nation. The Council's definition of standard of living differs from traditional measures in its focus on employees rather than the overall population and in its treatment of the current account. It shows on a per worker basis how much income is generated, plus or minus any change in what is owed to foreigners. By taking into account changes in foreign debt, the measure gives insight into potential future living standards. The Standard of Living Index compares U.S. performance to the average of the Other Summit 7. (The full technical definition and discussion of terms is found in Appendix III: Methodology.)





1972 = 100
Measured in constant 1980 dollars.

■ Since 1972, U.S. exports have not grown nearly as fast as world exports, despite the fact that America's share of world GNP has remained steady at about 23 percent (See chart, above left).

■ As a result of the relatively slower U.S. export growth, the Trade Index fell from 100 in 1972 to 82.6 in 1987 (See Index, upper left).

■ In 1987, however, U.S. exports ran counter to this downward trend and expanded much faster than the rest of the world. Last year, America's exports of goods and services increased 27.5 points (See chart, above right). As a result, the Trade Index increased from 74.5 to 82.6 in 1987.

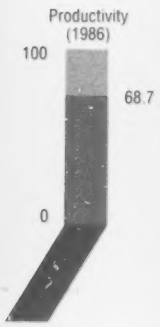
■ The 1987 trend shows how sensitive U.S. exports are to the value of the dollar. In the early 1980s, when the dollar was high, American exports declined. Since the drop of the dollar in 1985, U.S. exports have climbed dramatically.

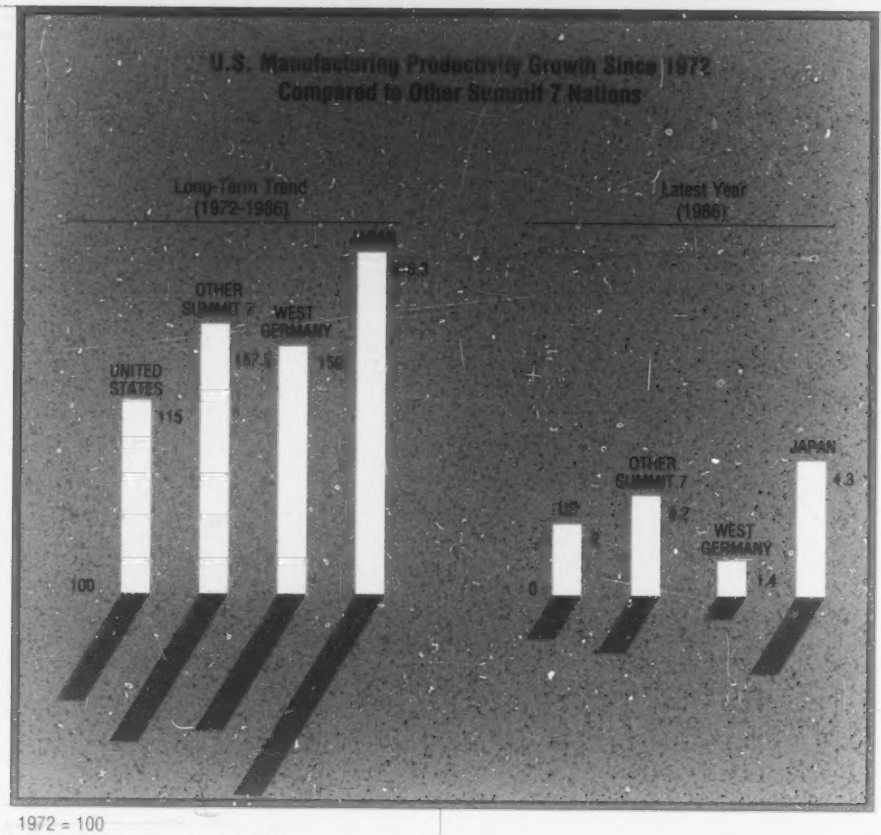
■ In absolute terms, the surge in U.S. exports has pushed the United States ahead of West Germany as the world's leading exporter. (Detailed information is provided in Appendix I: Trends in Absolute Growth.)

■ Despite the recent burst of U.S. exports, however, the United States still faces long-term competitiveness problems. First, because U.S. imports rose rapidly in 1987, America's trade deficit has not declined. Second, because U.S. productivity growth and investment continue to trail those of other industrial nations (see following pages), U.S. exporters may have trouble increasing future sales without further reductions in the value of the dollar.

■ The increasing U.S. reliance on imports is attested to by the fact that since 1972 U.S. manufactured imports have risen more than twice as fast as U.S. manufactured output. (Detailed information is contained in Appendix II: Background Data.)

The Trade Index measures the U.S. share of world exports. How well we live is increasingly determined by how well we compete in world markets. The Council chose exports as the single best indicator of the U.S. ability to compete worldwide. The Index focuses on the U.S. share of total world exports in order to take into account the rapid export growth of Asia and Latin America. (A complete definition is found in Appendix III: Methodology.)





1972 = 100
Measured in constant 1980 dollars.

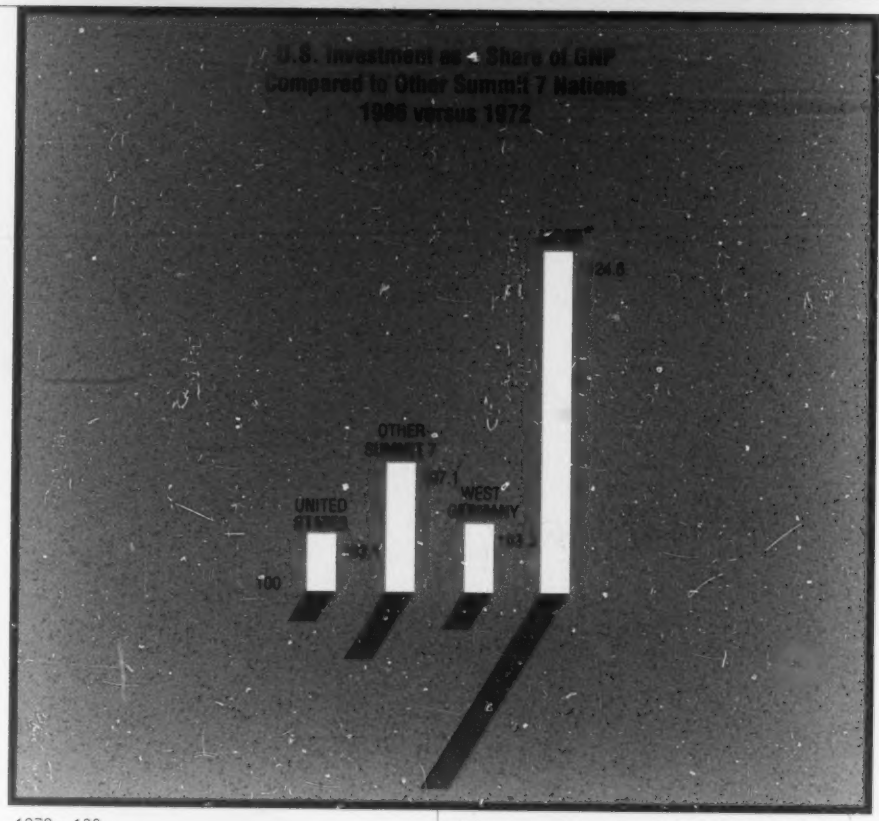
■ From 1972-1986, American manufacturing productivity expanded only 15 points, about one-fourth as fast as the average of the Other Summit 7 nations, one-third as fast as West Germany's and one-eighth as fast as Japan's (See chart, above left).

■ As a result of the slower U.S. manufacturing productivity growth relative to the Other Summit 7 nations, the Productivity Index declined from 100 in 1972 to 68.7 in 1986 (See Index, upper left).

■ During 1986 (the last period for which complete data are available), the measure of U.S. manufacturing productivity growth increased 2 points, faster than West Germany's, but more slowly than the average of the Other Summit 7, and only half as fast as Japan's (See chart, above right). As a result, the Productivity Index declined from 68.8 to 68.7.

■ In absolute terms, the United States still has the highest overall manufacturing productivity. But lagging growth rates have virtually eliminated the sizable productivity advantage that America enjoyed in the early 1970s. (More detailed information is provided in Appendix I: Trends in Absolute Growth.)

The Productivity Index measures output per employee in the manufacturing sector. Productivity is important because it fundamentally affects the cost of American products relative to those of other nations. The Productivity Index compares U.S. performance to the average of the Other Summit 7 industrial nations. (A complete definition is found in Appendix III: Methodology.)



1972 = 100
Measured in constant 1980 dollars.
* 1984

* Due to insufficient data, 1985-1986 do not include Japanese spending on education. For a detailed explanation, see Appendix III: Methodology.

■ In 1986 (the latest year for available data), U.S. investment as a percent of GNP was up 3.1 points from 1972 levels, about the same increase as West Germany's, but less than half the Other Summit 7 average and substantially less than Japan's (See chart above).

■ Because U.S. investment has not grown as rapidly as the average of the Other Summit 7 since 1972, the Investment Index dropped from 100 in 1972 to 96.2 in 1986 (See Index, upper left).

■ As a percent of GNP, the United States spends relatively more on education and R&D, but less on plant and equipment than the average of the Other Summit 7. Since 1972, U.S. investment in education has declined as a percent of GNP, while investment in plant and equipment and R&D has grown.

■ Since 1972, U.S. investment in education has increased at about the same rate as the average of the Other Summit 7; U.S. investment in plant and equipment has grown much faster than the Other Summit 7 average; and U.S. investment in non-defense R&D has grown more slowly than the Other Summit 7 average. (More complete information is found in Appendix I: Trends in Absolute Growth, and Appendix II: Background Data.)

■ America's extremely low savings rate undermines its ability to finance productive investment. In 1986, the aggregate U.S. savings rate fell to its lowest level in over 15 years. Although the average savings rates of the Other Summit 7 nations and West Germany also declined slightly, they remain well above the U.S. level. In Japan, the aggregate savings rate actually increased in 1986 to almost double that of the United States.

Investment is calculated as a weighted average of annual expenditures for education, non-defense R&D, and plant and equipment. These investments build the skills, knowledge and assets that underpin productivity, trade and, ultimately, the standard of living. The Investment Index compares the U.S. performance to the average of the Other Summit 7 nations. (A complete definition is found in Appendix III: Methodology.)

ACKNOWLEDGMENTS

The Competitiveness Index has been developed over the past several months by the Council on Competitiveness, working in conjunction with The WEFA Group (Wharton Econometric Forecasting Associates).

Council Executive Committee member Michael Porter (Professor, School of Business Administration, Harvard University) served as Project Adviser. The WEFA Group, especially Lawrence Chimerine (President) and Gerald Godshaw (Director of Government Policy Analysis), helped perform the economic analysis. Council Vice President Daniel Burton, Jr. served as Project Director.

ABOUT THE COUNCIL

Founded in 1986, the Council on Competitiveness is an organization of leading executives from industry, organized labor and higher education who have one overriding objective: to improve the ability of American companies and workers to compete in world markets. Among the Council's more specific goals are to increase public awareness of the competitiveness challenge; to promote consensus and cooperation on competitiveness-related issues within the private sector; and to assist in the development of far-sighted government policies that help Americans compete.

The Council is governed by an executive committee and draws on the resources of its national affiliates — more than two dozen trade associations, professional societies and research organizations — to help coordinate private sector activity. The Council is privately supported through contributions from its members, foundations and other granting institutions.

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Washington, DC 20004
(202) 662-8760

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COMPETITIVENESS INDEX

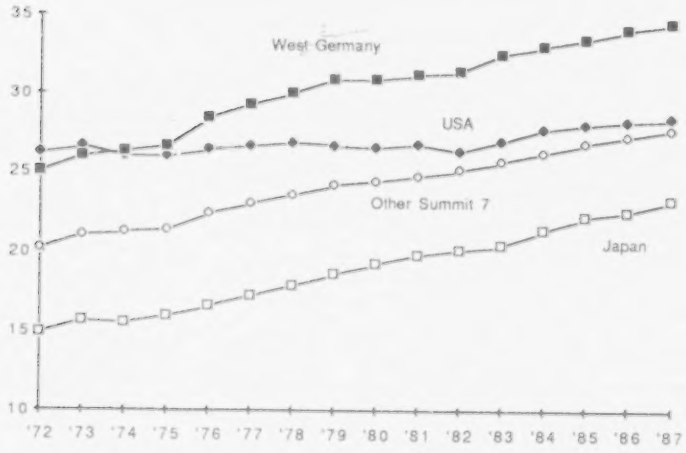
TRENDS,
BACKGROUND
DATA AND
METHODOLOGY

COMPETITIVENESS INDEX

APPENDIX I: TRENDS IN ABSOLUTE GROWTH

STANDARD OF LIVING

Trends in Absolute Growth
1972-1987
(Thousands of Dollars per Employee)



Standard of living is defined as Gross Domestic Product plus current account divided by the number of employees. Measured in constant 1980 dollars.

- In absolute terms, the West German standard of living has been higher than America's since 1974, and the gap is widening. In 1987, the share of U.S. GDP per employee was $28,400; in West Germany, it was $34,400.

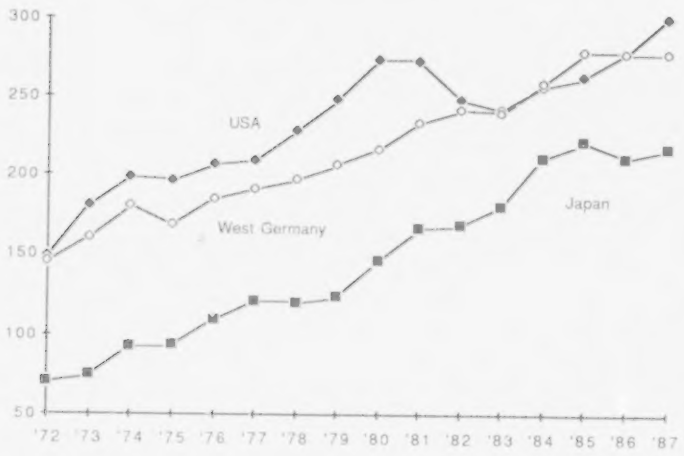
- Because of the lagging American standard of living growth rate, the gap between Japan and the United States has been steadily shrinking. In constant 1980 dollars, the share of GDP per employee in Japan was $23,200 in 1987. Measured at current exchange rates, however, the share of GDP per Japanese employee was much more.

- The average American's standard of living is still higher than the average citizen of the Other Summit 7 nations ($28,400 per employed American compared to $27,700 per employed in the average of the Other Summit 7), but the gap is narrowing.

- Labor compensation figures show similar trends. Measured in constant 1980 dollars, the average U.S. manufacturing worker earned $16,522 in 1986, less than the average West German worker ($19,594), but more than the average Japanese ($13,543). (See Appendix II: Data for Standard of Living.)

TRADE

Exports of Goods and Services
1972-1987
(Billions of U.S. Dollars)



Measured in constant 1980 dollars.

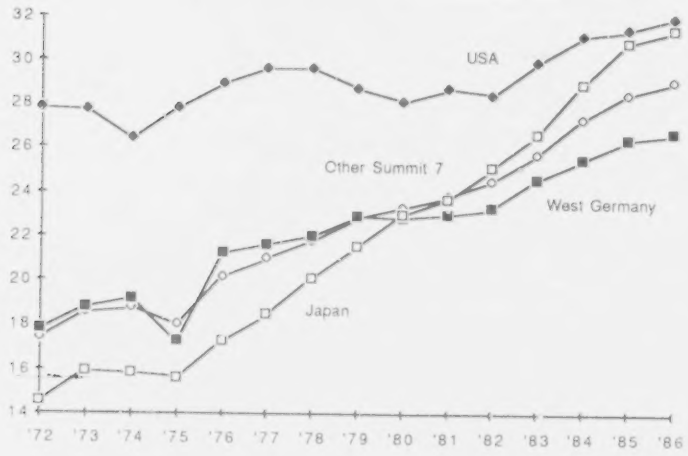
- In absolute terms, the 1987 U.S. export surge allowed America to reclaim the export lead from West Germany ($318 billion to $277 billion). From 1984-1986, West Germany's exports of goods and services either equalled or surpassed America's.

- Unfortunately, the export surge has not caused a large drop in the U.S. trade deficit because American imports have also continued to grow rapidly. In 1972, U.S. manufactured imports equalled 5 percent of total U.S. manufacturing output; in 1987, manufactured imports equalled 12 percent of total U.S. manufacturing output. The dramatic rise in U.S. manufactured imports is reflected in the ratio of U.S. manufacturing imports to U.S. manufacturing output, which rose from 100 in 1972 to 243 in 1987. This import-penetration measure shows that U.S. manufactured imports have risen two-and-a-half times as fast as U.S. manufactured output over the past 15 years. (See Appendix II: Data for International Accounts.)

- While the U.S. share of world GNP has remained fairly stable at 23 percent since 1972, the U.S. share of world exports dropped from 12 percent to a low of 9 percent in 1983. In 1987, with the surge in U.S. exports, the U.S. share of world exports increased to 10 percent. (See Appendix II: Data for International Accounts.)

PRODUCTIVITY

Trends in Absolute Growth
1972-1986
(Thousands of Dollars per Manufacturing Employee)



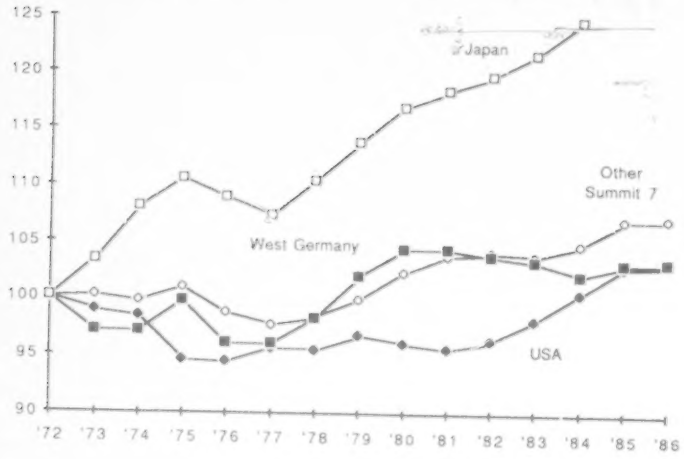
Output per manufacturing employee in constant 1980 dollars.

- As a result of slower U.S. manufacturing productivity growth, the absolute productivity advantage that the United States enjoyed in 1972 has almost disappeared. America and Japan are running neck and neck, and West Germany is not far behind.

- In 1986, absolute U.S. manufacturing productivity was equal to $32,000 per employee. That compared to $31,400 in Japan; $26,700 in West Germany; and $29,100 for the average employee of the Other Summit 7. (See Appendix II: Data for Productivity.)

INVESTMENT

Index of Comparative Growth Trends
1972-1986



Index of a weighted average percentage of GNP invested in education, non-defense R&D, and plant and equipment. 1972 = 100. Measured in constant 1980 dollars.

Note: Japan was excluded from the calculation for education expenditures for 1985-1986 due to insufficient data. For a detailed explanation, see Appendix III: Methodology.

- Since 1972, the U.S. Investment Index has grown at about the same rate as West Germany's, about half as fast as the average of the Other Summit 7, and much slower than Japan's.

- The United States still spends more as a percent of GNP on education and non-defense R&D than the average of the Other Summit 7, but less on plant and equipment.

- The U.S. savings rate, which provides the economic foundation for American investments, fell to 14.78 percent of GNP in 1987. This level is the lowest since 1972. It is well below the Other Summit 7 average of 22.45 percent of GNP, West Germany's 20.93 percent and Japan's 28.20 percent. (See Appendix II: Data for Investments.)

COMPETITIVENESS INDEX

APPENDIX II:
BACKGROUND
DATA

Competitivness Index
Standard of Living

Indicators of Standard of Living	1970	1971	1972	1973	1974	1975	1976	1977	1978
Relative Std. of Living Index (U.S./Other Summit 7)	103.8	102.6	100.0	97.4	94.1	93.6	90.5	89.2	87.7
U.S. Std. of Living Index	95.9	98.2	100.0	101.5	99.0	99.2	100.6	101.5	102.4
Non - U.S. Std. of Living Index	92.4	95.7	100.0	104.2	105.2	105.9	111.2	113.8	116.8
Germany Std. of Living Index	93.9	96.0	100.0	103.9	105.2	106.7	113.6	117.2	119.9
Japan Std. of Living Index	89.1	92.3	100.0	105.2	104.4	107.4	111.4	115.8	120.1
U.S. Std. of Living (Thou $ per employed)	25.17	25.76	26.24	26.64	25.97	26.02	26.39	26.64	26.87
Non - U.S. Std. of Living (Thou $ per employed)	18.66	19.32	20.19	21.05	21.24	21.40	22.45	22.99	23.59
Germany Std. of Living (Thou $ per employed)	23.47	24.01	25.00	25.98	26.31	26.68	28.40	29.29	29.97
Japan Std. of Living (Thou $ per employed)	13.25	13.74	14.88	15.66	15.53	15.98	16.59	17.23	17.88
U.S. Unemployment Rate	5.0	5.9	5.6	4.9	5.6	8.5	7.7	7.0	6.1
Non - U.S. Unemployment Rate	2.3	2.5	2.8	2.5	2.6	3.8	4.2	4.5	4.5
Germany Unemployment Rate	0.8	0.9	0.8	0.8	1.6	3.6	3.7	3.6	3.5
Japan Unemployment Rate	1.1	1.2	1.4	1.3	1.4	1.9	2.0	2.0	2.2
U.S. Labor Compensation (Wage & Sal $ per mfg. emp.)	15392.1	15529.4	16033.2	15900.4	15898.0	15650.3	16056.6	16306.2	16552.5
Germany Labor Compensation (Wage & Sal $ per mfg. emp.)	14218.4	14916.0	15364.1	15855.5	16609.1	17073.6	17392.8	18031.0	18072.8
Japan Labor Compensation (Wage & Sal $ per mfg. emp.)	7025.0	7611.7	8327.5	8811.7	9114.1	9829.6	10391.7	10712.2	10879.5
Relative Labor Compensation Index (base: Wage & Sal $ per mfg. emp.)	105.1	101.0	100.0	95.0	92.0	87.2	86.8	85.9	86.1

Data tables compiled by The WEFA Group

Competitivness Index
Standard of Living

Indicators of Standard of Living	1979	1980	1981	1982	1983	1984	1985	1986	1987
Relative Std. of Living Index (U.S./Other Summit 7)	84.8	83.6	83.0	80.5	80.8	81.2	80.5	79.8	78.9
U.S. Std. of Living Index	101.7	101.0	101.9	100.3	102.7	105.5	106.8	107.7	108.3
Non - U.S. Std. of Living Index	119.9	120.9	122.7	124.5	127.0	129.9	132.7	134.9	137.4
Germany Std. of Living Index	123.4	123.5	124.6	125.4	129.7	131.8	133.8	136.0	137.6
Japan Std. of Living Index	124.6	129.0	132.9	135.3	137.3	143.3	149.0	151.3	155.9
U.S. Std. of Living (Thou $ per employed)	26.68	26.51	26.74	26.30	26.94	27.68	28.03	28.27	28.42
Non - U.S. Std. of Living (Thou $ per employed)	24.20	24.41	24.78	25.14	25.65	26.23	26.80	27.25	27.74
Germany Std. of Living (Thou $ per employed)	30.85	30.87	31.15	31.36	32.44	32.94	33.44	34.01	34.41
Japan Std. of Living (Thou $ per employed)	18.57	19.20	19.77	20.13	20.43	21.33	22.17	22.52	23.20
U.S. Unemployment Rate	5.8	7.2	7.6	9.7	9.6	7.5	7.2	7.0	6.2
Non - U.S. Unemployment Rate	4.4	4.6	5.7	6.7	7.7	8.0	8.1	8.1	8.0
Germany Unemployment Rate	3.2	3.0	4.4	6.1	9.1	9.1	9.3	9.0	9.0
Japan Unemployment Rate	2.1	2.0	2.2	2.4	2.7	2.7	2.6	2.8	2.9
U.S. Labor Compensation (Wage & Sal $ per mfg. emp.)	16467.3	16406.0	16464.4	16453.5	16383.9	16447.7	16570.7	16521.6	
Germany Labor Compensation (Wage & Sal $ per mfg. emp.)	18288.0	18506.4	18752.0	18784.7	18801.8	18941.3	19484.3	19594.5	
Japan Labor Compensation (Wage & Sal $ per mfg. emp.)	11242.4	11559.4	11808.9	12207.5	12660.4	13109.6	13430.8	13542.6	
Relative Labor Compensation Index (base: Wage & Sal $ per mfg. emp.)	84.4	83.6	82.5	81.2	79.3	77.9	76.7	75.8	

Competitivness Index
International Accounts

	1970	1971	1972	1973	1974	1975	1976	1977	1978
Indicators of International Accounts									
Index of U.S. Share of World Exports	104.1	100.2	100.0	108.9	116.3	115.4	103.9	99.1	101.8
Index of Other Sum 7 Share of World Exports	99.5	99.7	100.0	99.8	101.7	100.7	101.2	100.9	99.7
Index of Non-U.S. World Exports	87.5	92.5	100.0	111.9	120.9	118.0	133.4	142.3	150.4
Index of Germany's Share of World Exports	103.0	101.9	100.0	101.3	104.1	94.8	95.4	93.8	90.9
Index of Japan's Share of World Exports	88.3	92.4	100.0	92.3	101.0	106.5	117.6	120.3	113.8
Index of U.S. Mfg. Imports to U.S. Mfg. Output	84.5	92.2	100.0	103.3	117.7	109.1	118.4	122.4	143.1
Index of U.S. Share of Sum 7 Exports	105.2	98.8	100.0	106.1	107.4	109.2	104.5	100.2	103.8
U.S. Index of Real Exports	92.2	92.2	100.0	121.5	133.7	132.7	139.2	141.4	154.6
Other Sum 7 Real Export Index	86.3	93.6	100.0	109.8	121.7	118.2	131.5	141.0	147.2
Germany Index of Real Exports	87.9	93.4	100.0	110.6	124.2	115.8	127.0	132.0	136.2
Japan Index of Real Exports	82.7	95.9	100.0	105.8	130.9	132.0	154.3	172.4	170.7
U.S. Share of Sum 7 Exports	0.24	0.22	0.23	0.24	0.24	0.25	0.24	0.23	0.23
U.S Mfg. Imports Share of U.S. Mfg. Output	0.04	0.04	0.05	0.05	0.06	0.05	0.06	0.06	0.07
U.S. Share of World Exports	0.12	0.12	0.12	0.13	0.14	0.13	0.12	0.12	0.12
U.S. Share of World GDP	0.25	0.25	0.25	0.24	0.24	0.23	0.23	0.24	0.24
U.S. Trade Balance (Bill $)	8.5	6.3	3.2	16.8	16.3	31.1	18.8	1.9	4.1 A
Index of Exchange Rate	88.8	92.3	100.0	108.7	108.9	115.6	108.3	112.4	126.9

Competitivness Index
International Accounts

	1979	1980	1981	1982	1983	1984	1985	1986	1987
Indicators of International Accounts									
Index of U.S. Share of World Exports	105.5	110.7	101.4	88.3	77.9	77.4	74.9	75.4	82.6
Index of Other Sum 7 Share of World Exports	99.3	100.1	100.7	100.0	98.5	99.3	99.7	98.7	97.8
Index of Non-U.S. World Exports	158.2	165.2	174.1	173.9	186.8	205.0	214.5	220.1	230.1
Index of Germany's Share of World Exports	92.3	91.6	92.7	96.5	91.2	94.5	95.4	93.8	93.9
Index of Japan's Share of World Exports	104.9	118.0	125.9	123.6	128.1	134.5	137.1	131.7	120.5
Index of U.S. Mfg. Imports to U.S. Mfg. Output	144.6	158.4	162.9	160.7	169.0	196.0	217.0	238.0	243.0
Index of U.S. Share of Sum 7 Exports	106.2	110.6	105.5	97.7	93.4	90.5	88.3	92.4	100.6
U.S. Index of Real Exports	167.5	184.4	183.7	167.6	163.1	173.1	177.3	187.7	215.2
Other Sum 7 Real Export Index	154.9	161.6	171.4	172.7	177.9	196.5	207.7	207.6	213.4
Germany Index of Real Exports	142.1	149.3	160.9	166.3	164.9	178.2	192.1	191.7	191.6
Japan Index of Real Exports	176.3	207.2	236.7	239.0	255.6	300.7	314.8	299.7	308.7
U.S. Share of Sum 7 Exports	0.24	0.25	0.24	0.22	0.21	0.20	0.20	0.21	0.23
U.S Mfg. Imports Share of U.S. Mfg. Output	0.07	0.08	0.08	0.08	0.08	0.09	0.10	0.11	0.12
U.S. Share of World Exports	0.12	0.13	0.12	0.10	0.09	0.09	0.09	0.09	0.10
U.S. Share of World GDP	0.23	0.23	0.23	0.22	0.23	0.23	0.23	0.23	0.23
U.S. Trade Balance (Bill $)	18.8	32.1	33.9	26.3	-6.1	-58.9	-79.2	-105.5	-120.3
Index of Exchange Rate	133.3	137.5	116.9	104.1	99.4	91.9	89.9	116.4	143.4

Competitivness Index
Manufacturing Productivity

	1970	1971	1972	1973	1974	1975	1976	1977	1978
Labor Productivity Indices									
Index of Relative U.S. Mfg. Productivity Labor	103.2	103.7	100.0	93.1	87.7	96.3	89.4	88.3	84.8
Index of U.S. Mfg. Prod.	94.2	97.8	100.0	99.5	95.1	99.9	103.8	106.6	106.3
% Change Year Ago		3.8	2.2	-0.5	-4.4	5.1	3.9	2.7	-0.3
Index of Summit 7 Mfg. Prod.	91.4	94.3	100.0	106.9	108.4	103.8	116.1	120.8	125.3
% Change Year Ago		3.3	6.0	6.9	1.4	-4.3	11.9	4.0	3.8
Index of Germany Mfg. Prod.	93.3	94.8	100.0	105.8	107.7	97.2	119.1	121.6	123.6
% Change Year Ago		1.6	5.5	5.8	1.8	-9.8	22.6	2.0	1.7
Index of Japan Mfg. Prod.	88.0	91.6	100.0	109.5	108.8	107.5	119.3	126.9	138.0
% Change Year Ago		4.1	9.2	9.5	-0.6	-1.2	10.9	6.4	8.7
U.S. Mfg. Productivity (Thou $ per emp)	26.2	27.2	27.8	27.7	26.4	27.8	28.9	29.6	29.6
Summit 7 Mfg. Prod. (Thou $ per emp,non -U.S.)	15.9	16.4	17.4	18.6	18.8	18.0	20.2	21.0	21.8
Germany Mfg. Productivity (Thou $ per emp)	16.6	16.9	17.8	18.8	19.2	17.3	21.2	21.6	22.0
Japan Mfg. Productivity (Thou $ per emp)	12.8	13.3	14.5	15.9	15.8	15.6	17.3	18.5	20.1

Competitivness Index
Manufacturing Productivity

	1979	1980	1981	1982	1983	1984	1985	1986
Labor Productivity Indices								
Index of Relative U.S. Mfg. Productivity Labor	78.7	75.6	75.3	72.5	72.7	71.1	68.8	68.7
Index of U.S. Mfg. Prod.	103.1	101.2	103.3	102.1	107.7	111.8	113.0	115.0
% Change Year Ago	-3.0	-1.8	2.0	-1.1	5.5	3.8	1.1	1.8
Index of Summit 7 Mfg. Prod.	131.0	133.8	137.1	140.8	148.1	157.2	164.1	167.3
% Change Year Ago	4.5	2.2	2.5	2.7	5.2	6.1	4.4	2.0
Index of Germany Mfg. Prod.	128.8	128.1	129.2	131.0	138.1	143.2	148.6	150.0
% Change Year Ago	4.2	-0.6	0.9	1.4	5.4	3.7	3.8	1.0
Index of Japan Mfg. Prod.	148.2	158.3	163.1	172.7	183.0	198.6	212.0	216.3
% Change Year Ago	7.4	6.8	3.1	5.8	6.0	8.5	6.7	2.0
U.S. Mfg. Productivity (Thou $ per emp)	28.7	28.1	28.7	28.4	29.9	31.1	31.4	32.0
Summit 7 Mfg. Prod. (Thou $ per emp,non -U.S.)	22.8	23.3	23.8	24.5	25.7	27.3	28.5	29.1
Germany Mfg. Productivity (Thou $ per emp)	22.9	22.8	23.0	23.3	24.6	25.5	26.4	26.7
Japan Mfg. Productivity (Thou $ per emp)	21.5	23.0	23.7	25.1	26.6	28.9	30.8	31.4

Competitivness Index
Investments

	1970	1971	1972	1973	1974	1975	1976	1977	1978
Indicators of Investment									
Relative Investment Index (U.S./Other Summit 7)		79.5	100.0	98.7	98.7	93.7	95.6	97.9	97.1
U.S. Index of Investments		99.7	100.0	98.9	98.4	94.6	94.4	95.6	95.5
Non-U.S. Index of Investment (Other Summit Seven)		125.5	100.0	100.2	99.7	101.0	98.7	97.7	98.4
Germany Index of Inv.			100.0	97.1	97.1	99.8	96.0	96.0	98.3
Japan Index of Inv.			100.0	103.3	108.0	110.6	108.9	107.5	110.5
Relative Education Exp. Index (U.S./Other Summit 7)	112.0	102.6	100.0	96.4	100.0	95.3	94.9	94.0	91.7
Relative Fixed Investment Index (U.S./Other Summit 7)			100.0	107.3	113.4	104.3	104.7	112.5	117.6
Relative Non-Defense R&D Exp. Index (U.S./Other Summit 7)		103.3	100.0	98.3	96.1	93.8	95.1	93.7	91.0
MEASURED BY PERCENT OF GDP:									
U.S. Education Expenditure	7.50	7.30	7.20	7.00	7.40	7.40	7.10	6.90	6.60
Other Summit 7 Ed.Expenditure	4.69	3.68	3.72	3.75	3.82	4.01	3.87	3.79	3.72
Germany Education Expenditure	4.11	4.65	4.77	4.86	5.29	5.53	5.18	5.04	5.03
Japan Education Expenditure	3.90	4.30	4.30	4.40	5.10	5.50	5.50	5.50	5.70
U.S. Non Res. Fixed Invest.			10.79	11.78	11.88	10.62	10.47	11.16	11.86
Other Summit 7 Non Res. Fixed Investment			14.83	15.09	14.39	13.98	13.74	13.64	13.86
Germany Non Res. Fixed Inv.			13.19	12.44	11.01	10.86	10.78	11.14	11.53
Japan Non Res. Fixed Inv.			20.24	21.31	20.11	19.94	19.01	18.36	18.52
U.S. Non-Defense R&D	2.63	2.48	2.40	2.31	2.29	2.27	2.27	2.23	2.22
Other Summit 7 R&D	1.64	1.67	1.67	1.63	1.66	1.68	1.66	1.66	1.70
Germany R&D Expenditure	2.06	2.18	2.20	2.09	2.13	2.22	2.15	2.15	2.24
Japan R&D Expenditure	1.81	1.85	1.86	1.90	1.97	1.96	1.95	1.93	2.00
U.S. Savings Rate	16.06	17.43	16.61	17.72	17.01	19.14	18.17	17.75	18.11
Other Summit 7 Savings Rate	23.03	22.68	23.22	23.64	22.77	23.20	23.54	23.13	24.40
Germany Savings Rate	21.72	21.02	21.07	20.01	20.35	20.99	20.63	18.95	20.03
Japan Savings Rate	32.89	31.02	31.26	30.82	29.58	29.02	30.05	29.66	30.66

Competitivness Index
Investments

	1979	1980	1981	1982	1983	1984	1985	1986	1987
Indicators of Investment									
Relative Investment Index (U.S./Other Summit 7)	96.9	93.9	92.0	92.5	94.5	95.9	96.2	96.2	
U.S. Index of Investments	96.8	96.1	95.6	96.3	98.1	100.5	102.9	103.1	
Non-U.S. Index of Investment (Other Summit Seven)	99.9	102.3	103.8	104.0	103.8	104.8	107.0	107.1	
Germany Index of Inv.	102.0	104.3	104.4	103.8	103.3	102.2	103.2	103.3	
Japan Index of Inv.	113.8	117.0	118.4	119.7	121.7	124.6			
Relative Education Exp. Index (U.S./Other Summit 7)	94.6	95.0	92.1	95.7	96.9	95.2	97.5	100.9	
Relative Fixed Investment Index (U.S./Other Summit 7)	120.1	113.8	117.2	114.0	110.6	119.5	120.2	113.4	108.8
Relative Non-Defense R&D Exp. Index (U.S./Other Summit 7)	88.9	90.4	88.0	90.6	90.2	89.3	88.5	87.4	
MEASURED BY PERCENT OF GDP:									
U.S. Education Expenditure	6.60	6.70	6.50	6.70	6.70	6.60	6.70	6.80	
Other Summit 7 Ed.Expenditure	3.60	3.64	3.65	3.62	3.57	3.58	3.55	3.48	
Germany Education Expenditure	5.02	5.22	5.25	5.12	4.93	4.74	4.65	4.53	
Japan Education Expenditure	5.80	5.90	5.70	5.70	5.70	5.60			
U.S. Non Res. Fixed Invest.	12.49	12.19	12.45	11.85	11.25	12.38	12.80	12.12	11.86
Other Summit 7 Non Res. Fixed Investment	14.30	14.71	14.60	14.29	13.99	14.23	14.63	14.69	14.99
Germany Non Res. Fixed Inv.	12.07	12.32	11.86	11.41	11.80	11.56	11.95	12.14	12.17
Japan Non Res. Fixed Inv.	19.05	19.10	19.19	18.96	18.67	19.40	20.04	20.55	21.09
U.S. Non-Defense R&D	2.27	2.38	2.43	2.58	2.62	2.62	2.70	2.70	
Other Summit 7 R&D	1.78	1.83	1.92	1.98	2.02	2.04	2.12	2.15	
Germany R&D Expenditure	2.40	2.42	2.49	2.58	2.57	2.63	2.67	2.70	
Japan R&D Expenditure	2.09	2.22	2.38	2.47	2.61	2.60	2.80	2.80	
U.S. Savings Rate	17.95	17.63	18.40	17.64	17.42	17.80	16.57	16.12	14.78
Other Summit 7 Savings Rate	23.60	22.61	22.29	22.02	22.10	22.50	22.35	22.72	22.45
Germany Savings Rate	20.04	19.22	19.16	19.17	19.57	19.78	19.42	20.98	20.93
Japan Savings Rate	28.70	28.06	27.95	27.28	27.11	27.15	27.16	27.72	28.20

COMPETITIVENESS INDEX

APPENDIX III: METHODOLOGY

INDICATORS OF THE U.S. COMPETITIVE POSITION

The WEFA Group (Wharton Econometric Forecasting Associates) has prepared indicators of the U.S. competitive position. The figures reflect discussions with a number of economic, business, and labor leaders as to the scope of analysis, concepts employed, and measures reported. The indicators presented reflect the changing world environment in which U.S. made goods and services must compete.

SCOPE OF ANALYSIS

The U.S. position in the world was compared other developed countries. The U.S. and six developed (Canada, France, Germany, Italy, Japan, and United Kingdom) economies (Summit 7) were compared because these countries represent the major U.S. competitors and such a comparison reveals how relative U.S. living standards have changed. A simple comparison is also made between the U.S. and the two other large western economies (Germany and Japan). A comparison with newly industrialized countries is not made because such a comparison might reflect some "catching-up" of living standards.

CONCEPTS EMPLOYED

Using general economic principles, four concepts which capture the notion of competitiveness were employed. The four concepts were standard of living, international accounts, productivity, and "investments".

Living standard measures were designed to assess trends in the welfare of the citizenry of the U.S. and the citizenry in other countries. The standard of living index measures output per employed net of the change in foreign obligations. Reducing output per employed by the change in obligations to foreigners indicates the resources available for domestic use after accounting for the accumulations potentially due foreigners. This measure of living standards is designed to reveal the resources available for future consumption. Comparisons of standard of living indices across countries reveal only trends in wealth and not necessarily differences in absolute levels. That is, wealth may have increased much faster in, say, Japan, while actual living standards may remain higher in the U.S.

To further explain living standards, unemployment rates and labor compensation differences measures are also reported.

The U.S. relative position in world trade is measured by the U.S. share of world exports as well as the U.S. and other countries' growth in exports. We also examined net exports (the trade balance) of the U.S. as well as the ratio of imports to domestic production in the manufacturing sector to determine the growing importance of imports in the economy. Finally, an index of actual exchange rates was created because the exchange rate represents the price of U.S. goods in world markets. The international account data indicate the importance of the U.S. in world trade. Thus, a rise in the index of the U.S. share of exports implies the U.S. is becoming more important in world markets.

Indicators of productivity are considered important in assessing the U.S. competitive position because productivity trends indicate both the ability to compete in world markets and changes in domestic living standards. That is, rising productivity levels, compared to our trading partners, can cause both an increase in living standards (more goods and services are produced for a given level of inputs) and an improvement in international accounts (the resource costs of domestic production goes down relative to the resource cost of foreign production). In comparing productivity indices across countries, note that a rise in one country's index relative to the U.S. does not necessarily imply that country's productivity level is higher than that of the U.S., but only that it has risen faster than the U.S. productivity level.

Productivity is measured in terms of labor productivity in the manufacturing sector. While multi-factor productivity might better reflect the true 'competitiveness' of a nation's goods and services, consistent estimates across countries exist for only labor productivity. Sectors other than manufacturing were also considered, but international competitiveness remains primarily confined to the manufacturing sector.

The last set of indicators reported in the tables are designed to give insight to investment trends which determine future productivity or living standard levels. The three major components of this investment index are education expenditures, research and development expenditures, and expenditures for plant and equipment. Education expenditure data reflects public expenditures for education as a share of Gross Domestic Product. Unfortunately, data for private sector training could not be located. Research and development expenditures include defense and non-defense expenditures as a share of Gross Domestic Product. Similarly, plant and equipment expenditures reflect private non residential investment as a share of Gross Domestic Product.

METHODS USED FOR CONSTRUCTING INDICATORS

Discussed below is a description of each variable, the method of aggregation used for comparison purposes, the availability of the data, and some of the data limitations.

Before describing each of the indicators constructed, a few general observations on the data and how it is reported. Wherever possible we attempted to make comparisons in terms of an index except when an index would be misleading or not be sensible. As explained below, data limitations precluded us from making comprehensive comparisons for all indicators. Further, for each indicator, international data sources were used when possible to insure comparability across countries.

For a variety of reasons 1972 was chosen as a base year for comparison purposes. First, we desired to exhibit long term trends in rather than developments in the past one or two years. Second, 1972 represents a point in time prior to a number of shocks to the world economy. It was before both floating exchange rates and the two major oil shocks. Finally, it represented the first full year for which we had a complete set of data.

I. INDICATORS OF LIVING STANDARDS

STANDARD OF LIVING MEASURES: The relative standard of living index (indexed so that 1972=100) measures the output per employed net of foreign obligations of the U.S. relative to a weighted average of other countries. The relative standard of living index is designed to reflect living standards net of a change in obligations to foreigners and indicate potential future living standards. All measures are in constant 1980 U.S. dollars. Algebraically, the relative standard of living index is derived from the measure of relative living standards, which are measured as:

RWE = ((USGDP-USCA)/USEMP)/SUM(WT*((FNGDP-FNCA)/FNEMP))

Where: RWE = Relative living standards,
USGDP = U.S. Gross Domestic Product in 1980 dollars,
USCA = U.S. Current Account Balance in 1980 dollars,
USEMP = U.S. employment,
WT = Foreign country weight of study group countries determined by share of total foreign country Gross Domestic Product,

FNGDP = Foreign country Gross Domestic Product in 1980 U.S. dollars converted using local deflator and 1980 exchange rate,
FNCA = Foreign country current account balance in 1980 U.S. dollars converted using local deflator and 1980 exchange rate, and
FNEMP = Foreign country employment.

The relative standard of living measure (RWE) is then indexed so that 1972=100.

The non-U.S. Standard of Living Index is an index of the level of per employee Gross Domestic Product net of the current account in comparison. Algebraically, non - U.S. living standards are:

NUSWE = SUM(WT*((FNGDP-FNCA)/FNEMP))

Where: NUSWE = Non-U.S. standard of living.

For comparative purposes this number is then indexed so 1972=100.

The U.S. Standard of Living Index is simply an index of U.S. GDP net of the current account per employee and yields insight into both the change in U.S. living standards and future living standards.

UNEMPLOYMENT RATE MEASURES: Relative unemployment rate of the U.S. compared to the weighted average of the study group countries. This index was set equal to 100 in 1972 and indicates the relative change in unemployment rates. Algebraically, the following is indexed so 1972=100:

RNRUT = (USNRUT)/SUM(WT*FNNRUT)

Where: RNRUT = Relative unemployment rate,
USNRUT = U.S. unemployment rate,
WT = Foreign country weight of study group countries determined by share of total foreign country Gross Domestic Product,
FNNRUT = Foreign country unemployment rate

Similarly, unemployment rate indices for the U.S. and non-U.S. countries are calculated.

LABOR COMPENSATION MEASURES: Relative compensation measures are in constant (1980) dollar terms with the relative labor compensation index representing changes in relative U.S. labor compensation. The labor compensation data was developed using both United Nations average manufacturing wage data and OECD manufacturing hourly wage rate index. Because manufacturing wage rate data was not available for France, only the U.S., U.K., Japan,

Germany, Italy, and Canada unit labor cost data were analyzed. Labor compensation indices were constructed using a relative labor compensation measure which examined average manufacturing wages in 1980 (the year for which United Nations data existed on a consistent basis). This measure was then inflated or deflated according to the OECD manufacturing labor compensation index. This methodology permitted us to compare average wage levels and not only rates of change in labor compensation. Thus, the relative labor compensation measure is:

RLC = (USWS/USNE)*USLCI/SUM(WT*(FNWS/FNNE)*FNLCI)

Where: RLC = Relative labor compensation,
USWS = U.S. manufacturing sector wages and salaries for 1980,
USNE = U.S. manufacturing sector number employed for 1980,
USLCI = U.S. manufacturing sector labor compensation index from the OECD,
WT = Foreign country weight of study group countries determined by share of total foreign country Gross Domestic Product,
FNWS = Foreign country manufacturing sector wages and salaries for 1980,
FNNE = Foreign country manufacturing sector number employed for 1980, and
FNLCI = Foreign country manufacturing sector labor compensation index from OECD

II. INTERNATIONAL ACCOUNTS

EXPORT MEASURES: Measures of U.S. exports relative to world and Summit 7 exports indicate the importance of the U.S. in world trade. An index of the U.S. export share of study group exports was created in a straightforward fashion by indexing the 1972 figure to 100. We also examine the growing importance of imports to the manufacturing sector by creating an index (1972=100) of the ratio of U.S. imports of manufactured goods to U.S. manufacturing output. An exchange rate index was also created to exhibit changes in the value of the dollar since 1970. To create an exchange rate index each country's exchange rate (in dollars per unit of local currency) was indexed to 100 in 1972 and a weighted average of the exchange rates was taken. Algebraically, the exchange rate index is:

REXIND = SUM(WT*FNREXIND)

Where: REXIND = Exchange rate index,
WT = Foreign country weight of study group countries determined by share of foreign country exports,
FNREXIND = Foreign country exchange rate index (1972=100)

Exports are used to weight foreign currencies because exports determine the demand for local currencies.

III. PRODUCTIVITY INDICATORS

Indicators of productivity are considered important because they are a true indication of both the ability to compete in foreign markets as well as domestic living standards. That is, rising productivity levels, compared to our trading partners, can cause both an increase in living standards as more goods and services are produced for a given level of inputs and an improvement in external balances as the resource cost of domestic production is relatively less than the resource cost of foreign production.

On an international basis, only labor productivity measures were available on a consistent basis across countries. The most consistent and best data was available through the U.S. Department of Labor Bureau of Labor Statistics (BLS) which measures productivity and labor costs in 12 countries but urges caution in making cross country comparisons. In fact, BLS only publishes indices of productivity in those twelve countries and special requests were made and filled to obtain data on levels of productivity. Further, BLS only makes these comparisons for labor productivity and not for total factor productivity. BLS does publish the best estimate of total factor productivity for the U.S., but because data on capital inputs in other countries is not reported on a consistent basis, cross-country comparisons of total factor productivity are not made by BLS.

In construction of the measures of productivity, only manufacturing labor productivity was examined because international competitiveness is measured primarily in the trade of manufactured goods. Interestingly, the level of U.S. manufacturing labor productivity remains above the weighted average of our trading partners, although the gap is rapidly closing. These dollar value comparisons were made using BLS data with foreign monetary values converted to U.S. dollars at purchasing power parity exchange rates (as done by BLS) rather than constant 1980 exchange rates. Thus, the measure of relative U.S. manufacturing productivity is:

RPROD = USPROD/SUM(WT*FNPROD)

Where: RPROD = The measure of relative U.S. labor productivity in the manufacturing sector compared to the study group,

USPROD = U.S. labor productivity in the manufacturing sector measured as the value of output per employee,

WT = Foreign country weight of study group countries determined by share of total foreign country Gross Domestic Product,

FNPROD = Foreign country labor productivity in the manufacturing sector as measured by the dollar value (computed at purchasing power parity exchange rates) of output per employee.

An index of relative manufacturing productivity was also created and set equal to 100 in 1972 as an indicator of changes in productivity. Separate indices were also created for the U.S. and the study group countries to analyze trends separately.

Finally, an index of U.S. multi-factor productivity (labor and capital) was constructed to reveal productivity trends resulting when both trends in labor and capital use are considered.

IV. INVESTMENT INDICATORS

The last set of indicators reported in the tables are designed to give insight into what determines future productivity or living standard levels. The measures of investment we have reported include both indices and other measures of the relative shares of GDP of education expenditures, fixed plant and equipment investment, and R&D spending. R&D spending does not include defense R&D spending. We also report in this section indicators of relative savings rates. Savings are an important source of funds to these investments, but are not included in the investment index to avoid double counting. That is, savings are the source of investments and including both in one index would count the same thing twice.

EDUCATION: Education expenditures are measured as a share of GDP with relative education investment measured as:

RED = (USED/USGDP)/SUM(WT*(FNED/FNGDP))

Where: RED = Relative education investment
USED = U.S. education investment in 1980 dollars
USGDP = U.S. gross domestic product in 1980 dollars
WT = Foreign country weight of study group countries determined by share of total foreign country gross domestic product
FNED = Foreign country education investment in 1980 U.S. dollars
FNGDP = Foreign country gross domestic product in 1980 U.S. dollars

Relative education investment was indexed so 1972=100 and decomposed to U.S. and foreign education indices. The data for education expenditures was obtained from the U.S. Department of Education as well as the Embassies of Canada, France, Germany, Italy, Japan, and the United Kingdom. For Japan data was only available through 1984 and the 1985 and 1986 relative indices omit Japan from the calculation of the education index.

FIXED INVESTMENT: Private fixed investment in plant and equipment was measured as a share of GDP with relative fixed investment measured as:

RIF = (USIF/USGDP)/SUM(WT*(FNIF/FNGDP))

Where: RIF = Relative fixed investment
USIF = U.S. fixed investment in 1980 dollars
USGDP = U.S. gross domestic product in 1980 dollars
WT = Foreign country weight of study group countries determined by share of total foreign country gross domestic product
FNIF = Foreign country fixed investment in 1980 U.S. dollars
FNGDP = Foreign country gross domestic product in 1980 U.S. dollars

Relative investment was then indexed so 1972=100 and decomposed to U.S. investment and foreign investment indices. The investment figures excluded residential investment.

R&D EXPENDITURES: R&D Expenditures were measured as a share of GDP. R&D expenditure data were available from the U.S. National Science Foundation for all Summit 7 countries. Relative R&D expenditures are calculated as:

RRD = (USRD/USGDP)/SUM(WT*(FNRD/FNGDP))

Where: RRD = Relative R&D Expenditures
USRD = U.S. R&D expenditures 1980 dollars
USGDP = U.S. gross domestic product in 1980 dollars
WT = Foreign country weight of study group countries determined by share of total foreign country gross domestic product
FNRD = Foreign country R&D expenditures in 1980 U.S. dollars
FNGDP = Foreign country gross domestic product in 1980 U.S. dollars

Again, an index was created so 1972=100. a